a plurality of garbage collection modules for reclaiming unused memory objects located within the shared memory, each garbage collection module associated with a processing unit, each garbage collection module operates on a dedicated heap of memory; and

a synchronizing module for synchronizing the activities performed by the garbage collection modules.

REMARKS

This Response is intended to fully respond to the First Office Action dated December 3, 2002. In that Office Action, claims 1-20 were examined and rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,289,360 issued to Kolodner et al.

Reexamination and reconsideration are respectfully requested in light of these remarks. Claims 1-20 are pending in the present application.

Claim Rejections – 35 U.S.C. § 102

Claims 1-20 were rejected under 35 U.S.C. § 102(e) as being anticipated by US Patent No. 6,289,360 issued to Kolodner et al., (hereinafter "Kolodner").

The Applicant respectfully traverses the Examiner's rejections based on Kolodner cited above. That is, the cited reference does not identically disclose all of the limitations of the claimed invention. More specifically, Kolodner does not identically disclose dividing memory into a heaps, each heap dedicated to one processor for garbage collection (see independent claims 1, 5, 10, 11, 15 and 20), let alone the elements related to performing garbage collection in parallel, using separate processors and separate garbage collection threads, and synchronizing the processors.

Under 35 U.S.C. § 102, a reference must show or describe each and every element

claimed in order to anticipate the claims. *Verdegaal Bros. v. Union Oil Co. of California* 814 F.2d 628 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.").

The Office Action states Kolodner describes the use of heaps in garbage collection. Although it is conceded that "heaps" in general are known units in designing garbage processes, Kolodner does not describe or teach the division of a shared memory into heaps in order to dedicate a heap to a processor for parallel garbage collection. Instead, Kolodner describes in detail how a mutator and a collector must cooperate in order to collect garbage. Importantly, cooperation between two separate threads, i.e., a mutator thread and a collector thread is wholly different from cooperation between two or more collector threads. Kolodner only describes the cooperation between a mutator and a *single* collector thread. Kolodner does mention that multiple collector threads may be used (Kolodner, Col. 12, ll. 39-44), but it states that the one or more program threads *"intermittently takes on the role of garbage collection"* and thus does not disclose parallel processing of garbage collection threads, let alone any synchronization between such threads.

Because Kolodner does not disclose multiple heaps dedicated, each dedicated to a separate collector thread, claims 1, 5, 10, 11, 15 and 20 are not anticipated by Kolodner and are allowable. All claims depending from those claims are also allowable.

Conclusion

As originally filed, the present application included 20 claims, 6 of which were independent. No amendments have been made and no new claims have been added. A

check in the amount of $110 is enclosed as payment of the fee for a one-month extension of time. It is believed that no further fees are due with this Response. However, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment with respect to this patent application to deposit account number 13-2725.

In light of the above remarks, it is believed that the application is now in condition for allowance, and such action is respectfully requested. Should any additional issues need to be resolved, the Examiner is requested to telephone the undersigned to attempt to resolve those issues.

Respectfully submitted,

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